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ABSTRACT

The new media--including videodisks, microcomputers, and communication networks--are now becoming widely accepted in the world of education. It is predicted that as a result there will be many rapid changes in school education, both in content and in methods. In order to analyze rates, degree, and methods of utilizing the new media, the NHK Radio and Television Culture Research Institute conducted a nationwide survey on the use of school broadcasting in Japan. The survey was designed to clarify the relationships between the use of school television and video recorder diffusion and utilization, the recording and use of videotapes of school programs from previous years, the use of general television programming in instruction, the use of locally-produced videotapes, and the use of commercial educational videotapes. It is noted that the diffusion of video recorders has changed the utilization of educational broadcasting in Japan and that other media, such as the microcomputer and the videodisk, have not achieved the popularity of the video recorder. (3 references) (Author/GL)

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School Broadcasting in Japan—Status and Trends

The 1986 Academic Year National Survey on Utilization of School Broadcasting

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The new media—videodiscs, microcomputers, communication networks, etc.—are now becoming widely accepted in the world of education. It is predicted that as a result there will be many rapid

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The new media—videodiscs, microcomputers, communication networks, etc.—are now becoming widely accepted in the world of education. It is predicted that as a result there will be many rapid changes in school education, both in content and in methods. In order to analyze rates, degree and methods of utilizing school program evolving under these new circumstances, the NHK Radio and Television Culture Research Institute conducted a nation-wide survey on the use of school broadcasting in Japan. This survey was designed to clarify the relationships between the use of school television and video recorder diffusion and utilization, the recording and use of videotapes of school programs from previous years, the use of general television programming in instruction, the use of locally-produced videotapes, the use of commercial educational videotapes, and so on. This report includes a discussion of the new educational media, e.g., microcomputers, videodiscs, and word processors, to include diffusion rates and their relationships to the use of school broadcasting. The current situation and trends found in the utilization of school broadcasting have been brought into bold relief thanks to the results of this survey.

Key words: educational broadcasting, educational radio, instructional television, video recordings, new media, microcomputers, videodiscs, tape libraries

I. INTRODUCTION

A number of years have passed since the new media, which have come about thanks to recent development in information technology, have begun to be positively applied to school education. Even so, as recently as just three or four years ago it was not possible for large numbers of teachers to secure instructional materials based upon these new media. A number of reasons may possibly be behind this phenomena. For example: (1) even those media which were technically perfected were still not diffused in large quantities, (2) the knowledge and skills required to use them had yet to be fully clarified; the same could be said to be true regarding their educational potential, and (3) even those new media which were commercially available were extremely expensive, thus making it impossible for most schools to purchase them.

However, by about 1985 the new media movement had begun to combine video, computer and communication technologies into high-performance information networks. It was also in 1985 that these new media, as practical technologies, began to find their way into the schools and classrooms. The first national conference on the instructional use of videodisc was held in 1985. In November 1986, in Kochi, a sminar on educational uses of microcomputers was held as part of the 37th Convention of the All-Japan Teachers' Federation for Studying the Use of Radio and Television in Education.

Although commercial videotape programs have been available for some time, it has just been during the past year or so that video rental stores have begun to open throughout the country, thus making it easy to rent and view video programs in one's own home.

Commercial educational video materials have also been available for some time, but it has been only during the past year or so that video programs designed to match school textbook content have become an important topic of conversation among teachers. Videodisc instructional materials which, in addition to being of outstanding quality, also take advantage of the fact that their technology permits immediate location and playing of any specific segment, are now starting to be available for use in science and social studies classes.

Research meetings and seminars on the educa-

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Table 1. Survey scope and response rates.

Type of school	Total number of schools in Japan	Abstraction ratios	Number of schools in sample	Number of usable responses	Percentage of usable responses
Kindergartens	15,076	1/15	1,014	747	73.7%
Nursery schools	23,471	1/23	1,022	767	75.0%
Elementary	24,809	1/24	1,002	892	89.0%
Junior high	10,991	1/11	1,013	861	85.0%
Senior high	5,225	1/5	1,051	902	85.8%
Total	79,572	—	5,102	4,169	81.7%

Notes: Survey taken between September 1 and November 30, 1986. Questionnairs were mailed with two follow-up requests. Schools were selected through structured random sampling using the *1986 Academic Year General Index of Japanese Schools* (Pub.: Genshoubou).

Table 2. Utilization rates and estimated number of schools utilizing NHK school programs.

Type of school	Television		Radio	
	Utilization rate	Estimated number of schools	Utilization rate	Estimated number of schools
Kindergartens	71.2%	10,734	13.9%	2,091
	(75.0)	±477	(14.7)	±365
Nursery schools	72.0%	16,899	11.1%	2,605
	(76.1)	±734	(8.7)	±513
Elementary	97.9%	24,288	7.8%	1,935
	(96.7)	±299	(9.4)	±429
Junior high	57.3%	6,298	10.8%	1,187
	(59.4)	±349	(13.8)	±219
Senior high	57.1%*	2,931	2.2%	115
	(62.5)	±154	(2.9)	±45

Notes: 1. Figures in parenthesis are for academic year 1986.
2. Compared to 1985, meaningful at the 95% level of confidence.
3. Estimated number of schools computed at the 95% level of confidence.

tional uses of microcomputer software have been held throughout Japan and many teachers are now beginning to use both locally-produced and commercial software in the classroom.

It is felt that the content of school education will change very rapidly in the near future as a result of this introduction of the new educational media into education. Against this background, the NHK Radio and Television Culture Research Institute conducted its 1986 annual National Survey on the Utilization of School Broadcasting by mail questionnaire between September and November 1986. Table 1 gives the scope and response rates for this survey.

As has been done in previous years, the survey included questions on utilization of school programs and on the diffusion of related instructional aids. This year, however, data was also gathered on changes in the utilization of school programs in relation to the diffusion of videotape recorders. These results, along with those on the relationships between the use of television school programs and the use of microcomputers and videodiscs, are given later in this report.

II. UTILIZATION OF RADIO AND TELEVISION SCHOOL PROGRAMS

"NHK Television School Program Utilization Rates" are computed at each level of education as the percentage of all the schools in Japan using NHK television school programs during a specific academic year. The rates for radio programs are computed in the same way. Table 2 shows the academic year 1986 NHK radio and television school program utilization rates for kindergartens, nurseries, elementary schools, and junior and senior high schools.

In academic year 1986, approximately 97.9% of the nation's 24,809 elementary schools were using NHK television school programs while 7.8% of them were using NHK radio school programs. The percentage for television was the highest it has ever been since the beginning of television school programs in 1953. It indicates

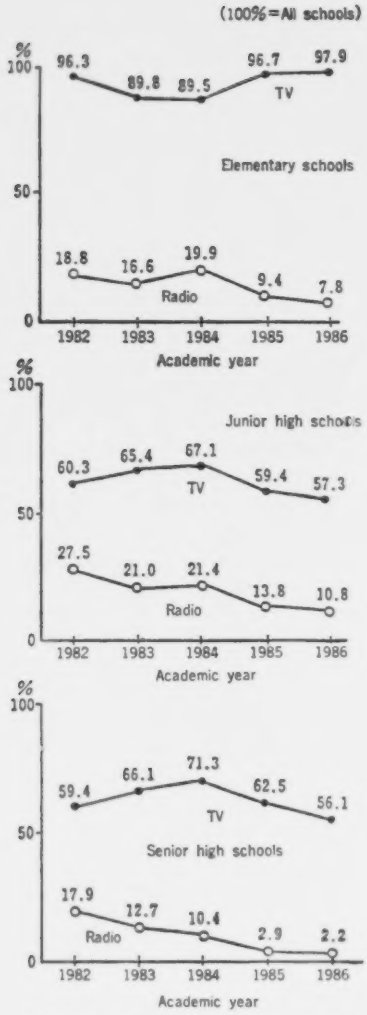

Fig. 1. Trends in NHK school program utilization rates.

that NHK television school programs were being used in various ways by approximately 24,300 elementary schools.

At the junior high school level, 57.3% of the schools were using NHK television school programs while 10.8% were using NHK radio school programs. For senior high schools, the utilization rate for NHK television school programs was 56.1%. Compared to 62.5% the previous year, this was a statistically significant drop of over 6%. NHK radio school programs were being used by 2.2% of the nation's senior high schools.

Figure 1 outlines the changes in utilization rates which have occurred between 1982 and 1986. It shows that the utilization rate for television at the elementary school level increased significantly between 1984 and 1985, and then continued to remain high during 1986. But it also reveals that 1984 was apparently a peak for junior and senior high school use of television school programs. Utilization rates for radio have continued to drop throughout the five-year period shown in this figure.

III. DEGREE OF SCHOOL PROGRAM UTILIZATION

The school broadcasting utilization rates given in Fig. 1 are based upon the school as the unit of measure. They are misleading in that they not only include schools wherein all the teachers are using 10 or more television school programs each week but they also include schools wherein only a solitary teacher is using a few programs from a single series each year. Both are counted as "schools using NHK school programs." Because of this, the "degree of utilization" for schools at these extremes is obviously a very different matter.

In order to be able to also compute the degree of utilization, each national survey on the use of school programs has always included the following:

A. Degree of Utilization of School Programs

One question included in the survey was:

"For this survey, the degree of program utilization is:"

"1) Use nearly all of the programs."
"2) Use approximately one-half of the programs."
"3) Use 1 to 3 programs each semester."
"4) Use 1 or 2 programs each year (asked of junior and senior high schools only)."

Based upon the responses to these questions, the degree of school program utilization has been defined as follows:

1) Continuous Utilization

Schools which replied that "nearly all of the programs" from at least one year-long or special series were being used.

2) Semi-continuous Utilization

Schools which replied "nearly all of the programs" or "approximately one-half of the programs" from at least one series were being used.

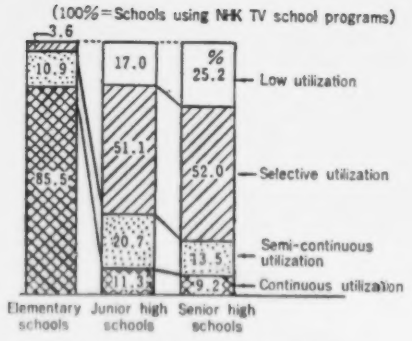

Fig. 2. Utilization of television.

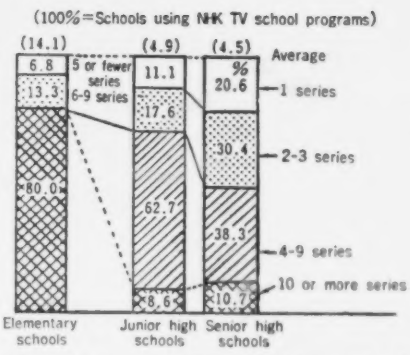

Fig. 3. Number of NHK television series being utilized.

3) Selective Utilization

Schools which neither replied that "nearly all of the programs" nor "approximately one-half of the programs" for even a single series were being used, but which did state that they "use from one to three programs each semester" from at least one series.

4) Low Utilization (Junior and Senior High Schools only)

Schools which replied negatively to all of the above, but which did state that they "use one or two programs each year" from a least one series.

Figure 2 shows the degrees of NHK television school program utilization computed and defined as above.

At the elementary school level, 85.5% of the schools which said that they are using NHK television school programs also stated that they were using them on a continuous basis. At this level, 37.9% of the nation's schools also replied that they were using 9 or more NHK television school program series on a continuous basis. As shown in Fig. 1, not only was the NHK television school program utilization rate for elementary schools during 1986 quite high, there were also many schools which were industriously using television school program series on a regular and continuous basis.

At the junior and senior high school levels, however, only approximately 10% of the schools which were using NHK television school programs stated that they were using them on a continuous basis. Most of them appeared to be "selective users," i.e., they used only from one to three programs each semester.

B. Number of School Program Series Utilized

NHK produced 31 different series for elementary school use during academic year 1986 (not including two series for special education). It also produced 14 series for junior high schools and another 24 for senior high schools. Fig. 3 shows how many of these series were being used at each level of schooling.

At the elementary school level, 80.8% of the schools were using 10 or more series. On the average, each school was using 14.1 series. Although not shown in this figure, 39.6% of the elementary schools were using 16 or more series.

As Fig. 3 shows, however, the degrees of utilization at the junior and senior high school levels are low. Most of the series marked as being used by junior and senior high schools were special series of only four to five programs in length. However, also as shown here, the utilization rates for individual programs appear to be relatively high.

C. Percentage of Classes Using School Programs

Nearly all of the elementary schools in Japan are based on the "single teacher-in-charge" class system. Generally speaking, therefore, the individual teachers in charge of each class decide whether or not to use television in their instruction. This permits a third method of measuring the degree of utilization at the elementary school level: calculating how many classes within each school are using NHK school television programs, in other words the number of classes using instruction television in comparison with the average number of classes per school. In connection with this, in 1986 the average elementary school in Japan had 13.2 classes.

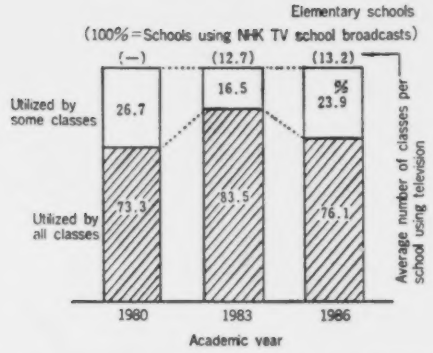

Fig. 4. Percentage of schools wherein all classes are using school television programs.

Figure 4 shows how the percentage of schools wherein all the classes are using school television programs has varied over the past several years. For 1986, all of the classes in 76.1% of the elementary schools using television were using television. This indicates that the number of schools wherein all the classes were using television was relatively high.

D. Percentage of Teachers Using School Television

Unlike elementary schools, most junior and senior high schools are organized on the basis of having a teacher (or teachers) in charge of each subject. Whether school television will be used or not is determined by the subject matter teachers and not by the homeroom teachers. At these levels, therefore, it is not really appropriate to calculate either the number or the percentage of classes using school television.

As a means of showing the degree of utilization at the junior and senior high levels, the percentages of junior and senior high school teachers using school television were computed. These are given in Fig. 5, which shows that five or more teachers are using television in 32.2% of the junior high schools using school broadcasting. This ratio is even higher (52.8%) at the senior high school level. In other words, in over one-half of the school at the senior high school level five or more teachers are using school television programs. Unfortunately, it is also not all that unusually to find schools wherein only one solitary teacher is using school television.

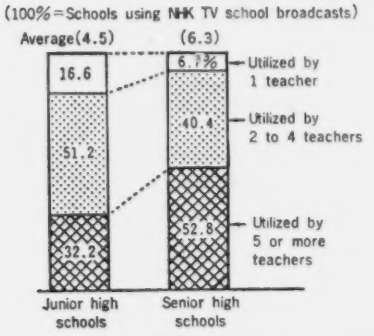

Fig. 5. Average number of teachers using television school programs.

In summary, viewed from either the standpoint of utilization rates, the number of series being used, or the number of classes in which they are being used, the survey showed that school television programs were being used relatively extensively at the elementary school level. It also revealed that, in comparison to the junior and senior high schools, elementary school utilization rates as well as degrees of utilization were rather high. While it is often said that the causes of this phenomena include the fact that the quality of the elementary school programs is basically higher or that the promotional activities of the All-Japan Teachers Federation for Studying the Use of Radio and Television in Education is much greater at the elementary school level, there may also be a number of external factors such as:

1) The elementary school system of having a single teacher in charge of each class is very important. It is difficult to arrange school television programs so that they will match the classroom schedules of subject matter teachers at the junior and senior high school level and therefore planned, continuous off-air utilization is very difficult. This isn't a problem for teachers at the elementary school level.

2) School broadcasting has been promoted for many years at the elementary school level and the groundwork for quicker acceptance of continuous utilization of programs as series has been laid. Also, a single elementary school teacher has to teach all of the curriculum and therefore his or her limitations in regards to subject matter are also important factors in promoting continuous utilization of entries series of program. It also appears easier for elementary school teachers to accept the idea that continuous utilization of programs in series strengthens television's capabilities to directly teach each child.

3) Further, the broadcaster is able to develop

Table 3. Utilization rates for elementary school TV school programs.
(100% = All schools)

Program title	Utilization rate (%)		Individual program utilization rate (%)	
Lower elementary grades				
Japanese lang, 1st Gr*	22.5	(17.7)	6.4	(4.0)
Japanese lang, 2nd Gr*	20.6	(16.3)	6.3	(3.9)
Japanese lang, 1st/2nd Gr*	54.6	(49.6)	27.2	(21.7)
Social studies, 1st Gr*	55.3	(46.9)	34.2	(26.3)
Social studies, 2nd Gr*	70.5	(63.9)	40.6	(35.6)
Arithmetic, 1st Gr	26.2	(22.5)	6.4	(4.5)
Arithmetic, 2nd Gr	19.1	(18.0)	5.7	(4.2)
Science, 1st Gr	81.3	(81.0)	48.2	(47.5)
Science, 2nd Gr	80.3	(77.6)	45.7	(43.7)
Music, 1st Gr	46.6	(43.2)	26.2	(21.9)
Music, 2nd Gr	41.0	(39.4)	19.7	(20.2)
Morals, 1/2 Gr	77.7	(75.0)	49.6	(45.9)
Interdisciplinary, 1/2 Gr	13.8	(12.1)	3.1	(2.8)
Traffic safety, 1/2 Gr#,*	18.5	(23.7)	2.8	(5.4)
Classes for the disabled%				
Enjoyable Classroom	29.5	—	13.1	—
Let's Go, Let's Try	21.3	—	7.0	—
Middle elementary grades				
Social studies, 3rd Gr	50.5	(46.1)	26.0	(22.5)
Social studies, 4th Gr	54.8	(55.2)	25.4	(25.9)
Science, 3rd Gr	79.5	(76.3)	39.9	(38.7)
Science, 4th Gr	77.8	(74.4)	37.7	(35.6)
Music, 3rd Gr	35.1	(30.8)	16.0	(14.0)
Music, 4th Gr#	12.2	—	4.0	—
Morals, 3rd Gr*	75.7	(71.4)	43.3	(41.1)
Morals, 4th Gr*	15.7	(10.2)	3.5	(0.7)
Upper elementary grades				
Social studies, 5th Gr*	45.3	(39.7)	21.0	(18.5)
Social studies, 6th Gr	68.7	(65.5)	35.0	(33.0)
Science, 5th Gr	75.0	(70.5)	32.0	(32.2)
Science, 6th Gr	70.9	(68.7)	29.5	(31.1)
Morals, 5/6th Gr*,#	60.2	(70.7)	30.5	(37.3)
Environmental education, 5/6th Gr	16.7	(13.5)	2.8	(1.0)
Other programs				
The "Micro" World	4.3	(6.1)	0.7	(0.4)
Strange Words	7.6	(5.9)	1.0	(1.3)
Your Picture, My Picture	2.2	(2.6)	0.3	(0.5)

Notes: # = New programs this year, but comparable with programs from previous year.
* = Compared to 1985, meaningful at the 95% level of confidence.
% = Percentages for these programs are based upon the number of schools (27.4% of all schools) which have classes for the mentally and physically handicapped.
( ) = Figures for academic year 1985.

program schedules and to offer numerous rebroadcasts which can better meet the needs at the elementary school level. In turn, this promotes the maintenance of higher degrees of utilization. As shown in Table 12, many schools were able to arrange their classroom schedules so as to match NHK's school program schedule.

The above reasons, however, are not related only to why off-air utilization is higher at the elementary school level, they also contribute to the fact that the use of prior-year programs is very high at the junior and senior high school levels. This will be discussed in more detail later on.

IV. UTILIZATION OF ELEMENTARY SCHOOL LEVEL SCHOOL BROADCASTS

Utilization rates for television and radio school broadcasts produced for elementary schools in 1986 are given in Tables 3 and 4. As can be seen, science, morals and social studies programs have relatively higher utilization rates. Science programs for the lower elementary grades have the highest utilization rates of all.

The utilization rate for "Elementary 1st Grade Science Classroom" was 81.3%. In other words, four out of every five elementary schools in Japan were using this program in some way or another. This program is broadcast as a once-a-week series. Nearly one-half (48.2%) of the school replied that they were using "nearly all the programs within the series." Utilization rates, as well as "continuous utilization" rates, were high for other science, and morals and social studies programs as well.

Some program titles were changed beginning with the 1986 academic year. "*Pyonta's* Safety" became "Safety Patrol" while "Cheerful Companions," an upper elementary grade morals program which had been on the air for 24 years, was renamed "Jump towards Tomorrow." "Merry Concert," a music program for 4th grade elementary school students, was newly established in 1986. All of these programs have been well received. For example, the utilization rate for "Jump towards Tomorrow" was 60%.

Based upon only those schools which have classes for such children, the utilization rates for two programs for mentally-retarded children,

Table 4. Utilization rates for elementary school radio school programs.
(100% = All schools)

Program title	Utilization rate (%)	Individual program utilization rate (%)
Japanese language 1st Gr	2.4 (2.2)	0.4 (0.1)
Japanese language 2nd Gr	2.5 (2.8)	0.3 (0.5)
Japanese language 3rd Gr	2.4 (2.6)	0.4 (0.1)
Japanese language 4th Gr	3.4 (3.9)	0.4 (0.5)
Japanese language 5th Gr	2.7 (2.8)	0.4 (0.1)
Japanese language 6th Gr	2.2 (2.2)	0.4 (0.1)
Music classroom 5th Gr	1.6 (1.7)	0.2 (0.1)
Music classroom 6th Gr	1.2 (1.3)	0.2 (0.2)

Note: Figures in parenthesis are for academic year 1985.

"Enjoyable Classroom" and "Say it! Try it!," were 29.5 and 21.3%, respectively. However, because the design of the survey did not include any means for specific sampling of these schools these figures are for general reference only.

V. UTILIZATION OF JUNIOR HIGH SCHOOL LEVEL SCHOOL BROADCASTS

School broadcasts are organized into lengthy series lasting from the beginning of April of one academic year through the end of March of the next. However, in order to more closely match the realities of the use of these programs and because it is now understood that many schools will possibly record them for later use, in 1980 NHK began to convert these long series into short, self-contained sub-series of four or five programs each. With the exceptions of "Making the Most of Your Junior High School Days" and "This Green Globe," nearly all of the programs for junior high school students are now grouped into relatively shorter, special sub-series.

For example, the junior high school series "World Geography" for academic year 1986 was organized into sub-series of four or five programs each on "Asia," "Western Asia and Africa," "Europe" "Latin America," and "Oceania." Each of these sub-series was broadcast, and then repeated before the next sub-series was presented. Other year-long series such as "History I" and "Science I (Physics)" were also sub-divided in this same way. However, the 1986 survey listed the titles of the major series, e.g., "World Geography," rather than the titles of any of the sub-series.

As shown in Table 5, the utilization rates for

Table 5. Utilization rates for junior high school TV school programs.
(100% = All schools)

Program title	Utilization rate (%)	Individual program utilization rate (%)
World Geography	21.6 (24.1)	1.5 (2.2)
Japanese Geography	19.7 (20.7)	1.2 (1.8)
History I	18.4 (20.5)	0.6 (1.8)
History II	15.6 (15.8)	0.7 (1.6)
Modern Sociology	11.3 —	0.7 —
Science I (Physics)	37.6	3.6
	(41.5)*	(5.0)*
Science II (Chemistry)	38.7	3.6
Science I (Biology)	46.0	4.2
	(46.5)*	(5.2)*
Science II (Physical Geog.)	40.5	3.8
Hello! Computer!#	3.6 —	0.2 —
This Green Globe (Environmental Ed.)	6.0 (8.5)	0.1 (0.4)
Morals	7.3 (5.5)	0.5 (0.5)
The "Micro" World	7.8 (6.9)	— (0.4)
The World of Japanese#	1.2 —	— —

Notes: Figures in parenthesis are for academic year 1985.
= New program for academic year 1986.
* = Statistics for academic year 1985 were based upon *Science I* and *Science II* combined; using the same method for academic year 1986 results in *Science I* = 41.2% and *Science II* = 48.4%.

the four science series were rather high, with "Science I (Biology)" having a utilization rate of 46.0%. However, a further analysis of the utilization rates for junior high school programs reveals a number of problems. For example, the utilization rate for "Science I (Biology)," just mentioned above, must be broken down as follows:

On-air direct utilization	0.5%*
Recorded for use at a different time	19.6%
Used programs recorded in previous years	26.2%

*(100% = All schools)

This indicates that most of the use of this series was actually use of programs from previous years. The survey also showed that junior high schools retained videotape copies of this series as follows:

From 1 to 5 tapes	15.4%
From 6 to 10 tapes	10.3%
11 or more tapes	10.2%

This, in turn, gives the teachers the freedom to select the programs they desire and use them at the time any time they wish. This custom, however, also results in such phenomena as, even though the series "Science Classroom for 1st

Table 6. Utilization rates for junior high school radio school programs.
(100% = All schools)

Program title	Utilization rate (%)		Individual program utilization rate (%)	
Morals, 1st year	9.4	(10.5)	0.2	(1.2)
Morals, 2nd year	8.0	(10.8)	0.1	(1.1)
Morals, 3rd year	7.7	(9.9)	0.3	(1.2)

Note: Figures in parenthesis are for academic year 1985.

Year Junior High Students" was discontinued at the end of academic year 1984, 23.3% of the schools reported that they were using these programs during academic year 1986.

Other characteristics which distinguish junior high school program utilization are covered in greater detail later in this paper.

VI. UTILIZATION OF SENIOR HIGH SCHOOL LEVEL SCHOOL BROADCASTS

The organizing of senior high school level school television broadcasts into special subseries began in academic year 1981. Then, in academic year 1982, NHK began to also broadcast its "Senior High School Lectures" series during the day. These were originally designed for correspondence school students. The utilization rates for these programs are shown in Tables 7 and 8.

Table 7. Utilization rates for senior high school TV school programs.
(100% = All schools)

Program title		Utilization rate (%)		Individual program utilization rate (%)	
Biology	*How Genes Work*	20.4	(25.6)	2.9	(4.6)
	Animal Behaviors	12.1	(15.7)	2.5	(3.0)
	The Human Animal	11.5	(12.6)	2.0	(2.7)
Physics and Chemistry	*Carbon Compounds*	8.0	—	1.6	—
	The Science of Waves	12.1	—	1.7	—
	The Science of Kinetics	10.6	—	1.4	—
Physical	*Atmospheric Movement*	10.8	—	1.4	—
Geography	*Landscape Science*	6.3	(9.6)	1.4	(2.1)
	The Living Globe	14.5	(15.9)	2.4	(2.6)
Geography	*New North America*	8.5	(10.2)	1.3	(1.6)
	New Russia and East Europe	8.6	(6.6)	1.7	(1.3)
Other series	*Japanese Architecture*	3.9	—	0.3	—
	Modern Japanese Paintings	3.2	(1.7)	0.4	—
	Intro. to Traditional Arts	1.8	—	0.1	—
	The World of Japanese	1.1	—	—	—
	Hello! Computer!	6.1	—	0.8	—
	Modern Sociology	3.9	—	0.4	—

Note: Figures in parenthesis are for academic year 1985.

Table 8. Utilization rates for senior high school TV and radio school programs.
(100% = All schools)

Program title		Utilization rate (%)		Individual program utilization rate (%)	
TV Senior High School Lectures	*Japanese History*	13.0	(16.6)	0.4	(0.7)
	World History	15.3	(14.6)	0.2	(0.4)
	People and Life Styles	18.2	(20.4)	1.3	(1.0)
	Introduction to Classics	7.4	(6.9)	0.1	(0.1)
	Science and Humanity	36.3	(37.8)	2.4	(3.4)
TV	*My "Blue Sky" Notes*	11.6	(14.7)	0.7	(0.9)
Radio	*Sr. H.S. Lecture Math II*	0.3	(0.5)	—	(—)
	Sr. H.S. Lecture Eng II	2.1	(1.2)	—	(0.1)

Note: Figures in parenthesis are for academic year 1985.

The most frequently used program at the senior high school level in 1986 was "Senior High School Lectures—Science and Humanity (Science I)." It had a utilization rate of 36.3%. "Biology" was the most frequently utilized program among those special series produced for senior high schools. The viewing rate for "How Genes Work" was 20.4%, the highest among all the various special series.

Just as at the junior high school level, much of the utilization was a result of recording, keeping and using programs which had been aired in previous years.

Off-air utilization	0.7%*
Recorded for use at a different time	19.1%
Used programs recorded in previous years	24.8%

*(100% = All schools)

For example, the series "Senior High School Lectures—Science I" was discontinued at the end of academic year 1984. But the percentages of schools having and/or using this series in 1986 were as follows:

Schools with tapes of this series	36.7%
From 1 to 5 tapes	10.4%
From 6 to 10 tapes	9.3%
From 11 to 20 tapes	7.6%
21 or more tapes	8.2%
Schools using this series	28.5%

This shows that at the senior high school level also, programs from previous years and from

discontinued series are used more than are programs which are being broadcast during the current academic year.

Senior high schools, however, are not using just programs from previous years, as will be discussed later, they are also using a wide diversity of materials to include general television programming, commercial videotapes, videodisc instructional materials and personal computer instructional materials.

Utilization of the Radio Program, "Teachers' Hour"

At present, "Teachers' Hour" is broadcasted every Sunday on NHK's second radio network. Unlike school broadcasts, this program is designed for the individual teacher.

Rather than a sampling of all of the teachers in Japan, only those in charge of audiovisual education and/or educational broadcasting (i.e., those who filled out the responses to this survey) were asked if they had listened to this program at any time during the 1986 academic year. Their replies, listed below, are of reference value only.

Elementary School Teachers	12.2%
Junior High School Teachers	9.2%
Senior High School Teachers	7.5%

(100% = Teachers in charge of audiovisual education in all of the schools)

VII. DIFFUSION OF TELEVISION RECEIVERS

The television receiver diffusion rate at the elementary school level was over 95% by 1965. It has continued to climb ever since and today it is nearly 100%. The diffusion rates for junior and senior high schools show almost the same patterns (Table 9).

For academic year 1986, the average elementary school in Japan has 17.1 television receivers, well above the national average of 13-plus classes per school. Junior and senior high schools now have an average of 10.9 and 10.5 television receivers, respectively, a small but definite increase over the previous year.

However, as far as the use of television school broadcasting is concerned the percentage of schools with television available in every classroom may be a more important statistic than are simple television receiver diffusion rates. Figure 6 shows how these percentages have changed in the elementary and junior high schools during the past eight years. In academic year 1978 only 73.2% of Japan's elementary schools had a television receiver in every classroom. This has increased each year until by 1986 it was 95.0%.

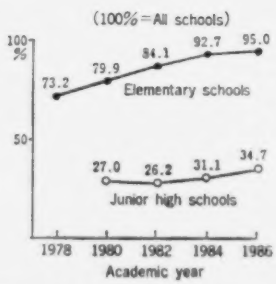

Fig. 6. Changes in the percentage of schools with television sets available in every classroom. Figures through 1981 are based upon "black and white plus color TV:" beginning in 1982 they are for "color TV" only.

Table 9. Diffusion of color television receivers. (100% = All schools)

Type of school	Diffusion rate	Average number of TV receivers in schools with TV (%)	Percentage of schools with TV receivers in every classroom (%)
Elementary	99.9	17.1	95.0
	(100.0)	(16.8)	(94.5)
Junior high	99.3	10.9	34.7
	(99.8)	(9.5)	(30.6)
Senior high	99.7	10.5	3.1
	(99.6)	(9.0)	(1.5)

Note: Figures in parenthesis are for academic year 1985.

Common sense precludes the idea that general television entertainment programs are being used in the schools. On the contrary, it is more generally believed that television receivers are put into the schools so that students will be able to view prefectural school programs or (with the exception of a very few prefectures) NHK's school broadcasts. That so many of the nation's schools have been willing to devote rather high levels of capital expenditure to television so that they will be able to use NHK school programs in instruction is a very important feature of education in Japan today.

The fact that since 1980, when it was only 27.0%, there has been no really significant change in the percentage of classrooms with television at the junior high school level is most likely related to an increase in the use of videotape recordings. This will be discussed in greater deal later on.

Table 10. Distribution of texts for school programs.

(100% = All schools)

Type of school	Diffusion rate (%)	All of the teachers have copies	Some of the teachers have copies	Available in the school
Elementary schools	98.5 (98.5)	79.8 (83.0)	8.2 (7.7)	10.5 (7.7)
Junior high schools	73.3 (71.5)	1.2 (0.9)	18.7 (17.1)	53.4 (53.4)
Senior high schools	57.8 (56.9)	0.1 (1.5)	24.6 (24.5)	33.1 (31.9)

Note: Figures in parenthesis are for academic year 1985.
"No response" questionnaires were ignored.

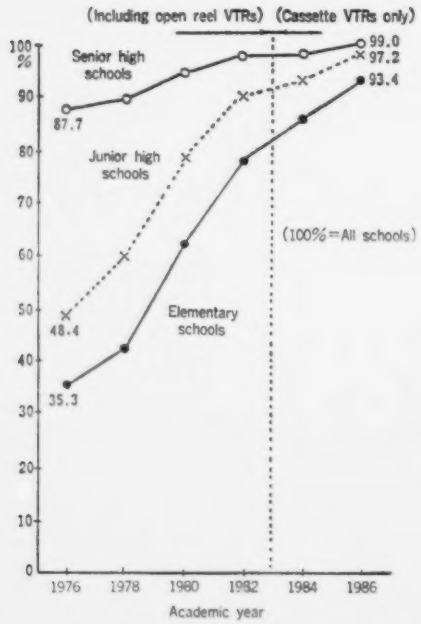

Fig. 7. Video tape recorder diffusion rates (open-reel and cassette). Figures through 1982 are based upon "open reel plus cassette VTRs:" beginning in 1984 they are for "cassette only."

Distribution of NHK School Broadcast Texts

Table 10 shows the percentage of the schools in Japan which had purchased NHK school broadcast texts (NHK Publishing Co.) during 1986. The diffusion rate in the elementary schools, where television school broadcasting utilization rates are highest, was a relatively high 98.5%. Of particular note is the high percentage of elementary schools wherein all of the teachers have copies. In 79.8% of the nation's elementary schools every teacher was able to have his or her own copy of NHK's school broadcast texts.

VIII. DIFFUSION OF VIDEO RECORDERS AND RECORDING UTILIZATION

As has been shown in these annual reports on the nation-wide surveys on the utilization of school broadcasting, diffusion rates for video recorders has increased rapidly over the past 10 years. The video recorder diffusion rate at the senior high school level apparently reached a ceiling of sorts around 1982. The rate at the junior high school level is now beginning to approach that same level. The diffusion rate at the elementary school level began to grow about

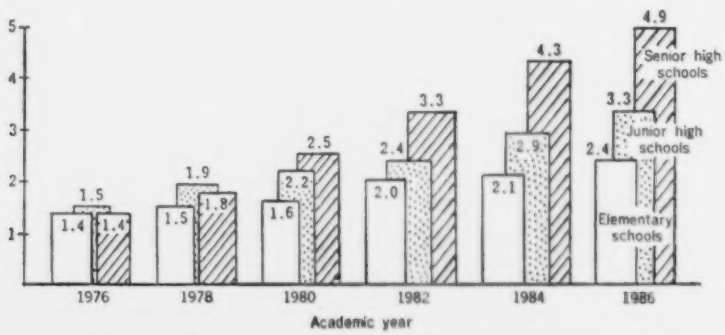

Fig. 8. Trends in the numbers of color cassettes video tape recorders available per school.

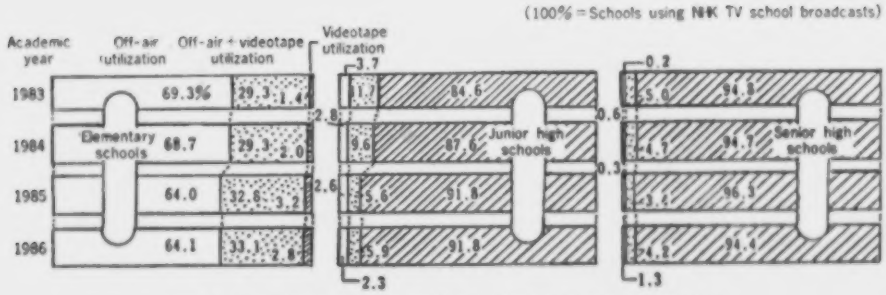

Fig. 9. Trends in off-air and recorded television utilization.

10% a year from around 1975 and by academic year 1986 it had reached 93.4%. Video recorder diffusion rates for all levels of school are now over 90%.

Figure 8 shows how the number of video recorders per school has grown over the past 10 years. Their availability at all levels has continued to increase during the past three or four years. There is today an average of nearly five video recorders per school at the senior high school level.

As a result of the fact that video recorders are now available in nearly every school, there has been a trend for off-air use of television school broadcasts to decrease and for use of recorded programs to increase. Using recordings makes it much easier to utilize television school programs in junior and senior high schools, where the curriculum is scheduled around the subject-matter teachers. As a result, television utilization rates are going up. These trends in how television school broadcasts are being used have resulted in changes in how these programs are edited. Another consequence has been that beginning from around 1980 more and more program specials or sub-series have been produced.

Attention is now being paid to how the use of recorded television school programs is effecting the elementary schools, that level which is most active as far off-air utilization is concerned. Figure 9 shows that at the elementary school level, as the number of video recorders available began to grow, the trend through academic year 1985 was for the percentage of schools "using both off-air and recorded" programs to increase in comparison with overall utilization. However, a new trend appeared between academic years 1985 and 1986. The percentages of elementary schools either "using only off-air programs" or "using both off-air and recorded programs"

Table 11. Diffusion of color cassette videotape recorders.

(100% = All schools)

Type of school	Diffusion rate (%)	Number of videotape recorders per school for schools with videotape recorders
Elementary schools	93.4*	2.4
	(85.6)	(2.1)
Junior high schools	97.2	3.3
	(96.0)	(2.9)
Senior high schools	99.0	4.9
	(98.3)	(4.3)

Note: Figures in parenthesis are for academic year 1985.
* = Compared to 1895, meaningful at the 95% level of confidence.

did not increase as it had in the past. For example, the percentage of schools "using both off-air and recorded programs" increased from 32.8% to only 33.1% between academic years 1984 and 1986.

A more detailed look at those schools which replied they were "using both off-air and recorded programs" shows the following:

Of the 32.4% of the schools using both off-air and recorded programs:

Those using mostly off-air programs 25.9%
Those using them about equally 3.0%
Those using mostly recorded programs 3.4%

These figures changed little from the previous year.

There may be a number of reasons as to why elementary school use of recorded programs has not increased. First of all, as was stated above, almost all of the elementary schools have television in every classroom. This makes off-air utilization rather simple. At the same time, NHK prepares its elementary school educational program broadcasting schedule so as to make off-air utilization as easy as possible. Together,

Table 12. Percentage of schools wherein the classroom schedules and NHK's TV school program schedules match.

(100% = All schools)

Grade	Subject					
	Japanese	Social studies	Arithmetic	Science	Music	Morals
1st	25.8%	52.7	20.0	54.6	27.2	53.3
2nd	21.3	50.1	17.4	55.7	23.9	51.9
3rd	—	49.0	—	53.6	20.6	52.3
4th	—	48.1	—	51.1	12.9	49.2
5th	—	46.4	—	48.9	—	46.6
6th	—	49.0	—	48.5	—	47.6

Note: The number of "No response" replies was very small and are therefore included in the above calculations.

these factors possibly make off-air utilization simpler and more convenient than is the use of recorded programs.

Table 12 shows the extent to which NHK's television school program schedule matches the elementary schools' daily curricula. From this it can be seen that for science, morals and social studies programs, all of which have high utilization rates, NHK's schedule matches the daily curricula in approximately one-half of all of the elementary schools.

Also, even though video recorder diffusion rates are increasing rapidly, the typical 13-plus class elementary school has, on the average, only 2.4 video recorders. This naturally makes it very difficult to use recorded programs with every class.

In more and more elementary schools all of the teachers are using television school programs—all of the teachers may need television school broadcasting—but it is not possible for an entire school to use recorded programs if it owns only a very few video recorders. In this, elementary schools are quite different from junior and senior high schools where—even though a certain school may be using television—only a small minority of its teachers are actually involved in its use.

Furthermore, elementary school teachers are different from junior and senior high school teachers in that their training may not be as "specialized." Most likely recorded utilization is not increasing at the elementary school level for many of the same reasons that television school program utilization rates and degrees of utilization are highest at this same level. An example may be the belief of many teachers that "continuous use of complete series of programs" is best or other questions related to the philosophy of the use of educational broadcasting.

Admittedly, the surveys conducted by the NHK Radio and Television Culture Research Institute over the years indicate that many elementary school teachers accept the educational broadcasting concepts of "off-air, continuous, and in their entirety." But, as is described in greater detail below, elementary schools are also using a great deal of general television programming and commercially-produced videotapes. Also, because it is anticipated that school ownership of video recorders will continue to increase, it may be too premature to say that recorded utilization at the elementary school level has reached a ceiling of any sort. It is believed that for the next several years a great deal of attention must be paid to future developments in the utilization of recorded school programs at the elementary school level.

IX. RETENTION AND UTILIZATION OF PROGRAMS FROM PREVIOUS YEARS

Recorded utilization has increased as a natural result of the diffusion of video recorders, even though such trends may conflict with the traditional concepts of educational broadcasting. However, a problem even more closely connected to the basic concepts of educational broadcasting is that of using programs from previous years.

One major advantage of television school programs is that they are readily able to transmit changes occurring in society almost as quickly as they happen. This characteristic makes television school broadcasting unique among the audiovisual educational media. Although the diffusion of video recorders has resulted in a reduction in off-air utilization, in other words in the simultaneous "as broadcast" use of television school programs, as long as these programs are going to used as "television," then "it is best to use even those programs which have been re-

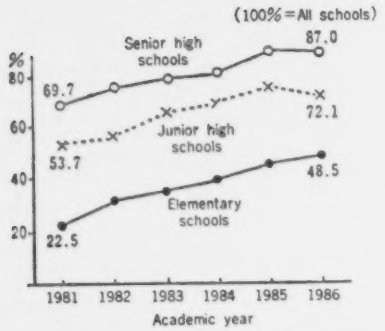

Fig. 10. Percentage of schools maintaining videotapes of past programs.

corded as soon as possible after they have been aired." Furthermore, continuous, off-air utilization of school broadcasting is considered by many as a way of using educational broadcasting which permits the teacher to take advantage of those positive features of broadcasting arising primarily from the fact that the programs have been intentionally edited as series. However as a result of the recent diffusion of video recorders plus the ever-lowering costs of videotape, there has been a rapid increase in the number of schools which are using school television programs that have been recorded and kept from previous years.

Figure 10 shows how the percentage of schools keeping files of programs broadcast in previous years has increased between academic years 1981 and 1986. In five years, the percentage of elementary schools keeping copies of NHK television school programs broadcast in previous years increased from 22.5% to 48.5%. The percentages for junior and senior high schools, already rather high in 1981, have also continued to increase until by academic year 1986, 72.1% of the junior and 87.0% of the senior high schools were keeping files of programs broadcast in previous years. These figures are higher than even the percentages of schools reporting that they are using NHK television school programs.

This figure shows only the percentages of schools which are retaining files of past programs. Actually utilization rates for these programs during academic year 1986 were as follows:

Elementary Schools	33.3%
Junior High Schools	48.3%
Senior High Schools	46.9%

(100% = All schools)

The quantities of videotapes of previous year

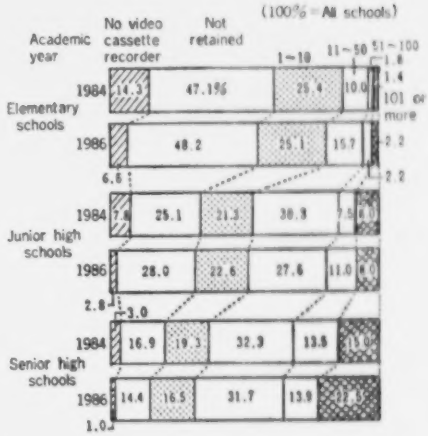

Fig. 11. Trends in the number of past-program videotapes retained in the schools.

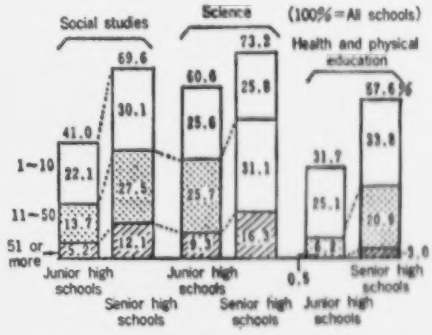

Fig. 12. Number of past-program videotapes retained by the schools by school subject.

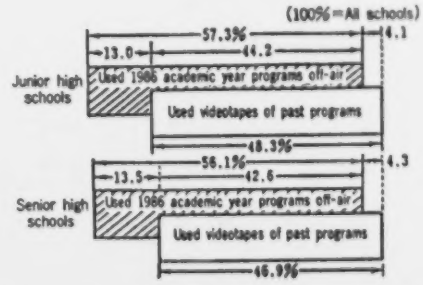

Fig. 13. Comparison of schools using off-air television school programs and those using videotapes of past programs during academic year 1986.

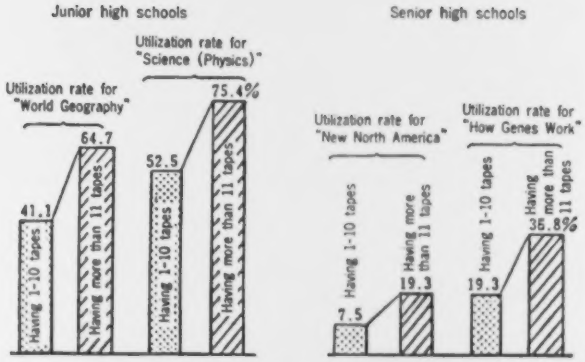

Fig. 14. Relationship between numbers of past-program videotapes retained by the schools and the utilization of programs broadcast during the 1986 academic year.

programs retained by the schools for academic year 1984 and again for academic year 1986 are shown in Fig. 11. As this figure shows, for academic year 1984, 15.05% of the senior high schools had over 100 video tapes on file. By 1986 this had increased to 22.5%. The volume of video tapes kept on file at other levels of schooling are increasing in a similar fashion.

Figure 12 is a breakdown of junior and senior high school videotape libraries by subject matter. Generally speaking, most of the tapes are from the rather frequently used science and social study program series or are for health and physical education. Although not shown in this figure, the schools also have relatively high numbers of videotapes on Domestic Science, Industrial Arts and Home Making, Japanese and English. By subject, science programs account for the largest single block of videotapes.

Since the schools are now retaining videotape files of school programs, the question becomes "Are current year programs (for this survey, academic year 1986) being used?" Figure 13 gives a reassuring answer. Almost all of the schools which are using programs from previous years are also using programs being broadcast during the current year.

At the junior high school level, 44.2% of the schools were using both while just 4.1% of the schools were using only programs from previous years. At the senior high school level, 56.1% of the schools were using current year programs while 42.6% were using both current and previous year programs. This means that although nearly half of the senior high schools were using programs from previous years, current year programs were also greatly in demand.

A more detailed analysis by subject matter makes this fact even more evident. Figure 14 shows the relationship between the number of videotapes of previous year programs on hand and the utilization of programs broadcast during academic year 1986. Nearly half of the junior high schools which were keeping videotapes of previous year programs had from 1 to 10 social studies videotapes while the others had 11 or more. The utilization rate for the social studies program "World Geography," broadcast during academic year 1986, was 64.7% for those schools with more than 10 prior-year videotapes on hand but only 41.1% for those with 10 or fewer. While only 21.1% of all the schools included in the survey were using "World Geography," it is obvious that the utilization rate for this program is higher among those schools with libraries of programs from previous years. Even more, the utilization rate for those schools with larger files of prior-year programs was higher than it was for schools with relatively smaller libraries of such tapes.

From this it can be assumed that those social studies teachers who are already highly motivated to use instructional television are also the ones who have relatively larger libraries of social studies videotapes, the ones who are interested in and who do record new social studies television programs in order to expand their libraries and the ones who, individually at each separate school, select and use those programs which they feel are most pertinent to their instructional requirements.

Figure 14 shows that these relationships also hold true for junior high school science programs as well as for senior high school social studies

and science programs. Much the same can be said for other subjects not shown in this figure.

X. UTILIZATION OF GENERAL TELEVISION PROGRAMS

Another effect of the diffusion of video recorders has been a rapid increase in the educational utilization of general television programs. In this paper, "general television programs" refer to all television programs other than those NHK television school broadcasts listed in Tables 3 through 8.

A survey conducted by the NHK Radio and Television Culture Research Institute showed that, nationally, the diffusion rate for home video recorders was 44.5% as of November 1986. Teachers are now beginning to record programs at home so that they can take them to school to use in their classrooms. Table 13 shows the percentage of schools which, in the surveys for academic years 1985 and 1986, replied "Yes" to the question: "Are any of your teachers who have home video recorders taping programs at home and bringing them to school for instructional purposes?"

The percentage of elementary schools which answered this question in the affirmative increased from 42.5% in 1985 to 55.2% in 1986, a jump of nearly 13%. The increase at the junior high school level was from 55.8% to 69.1%, just over 13%. And, at the senior high school level, 84.1% of the schools replied in academic year 1986 that "There are some teachers who are doing so."

Table 13. Percentage of schools wherein the teachers videotape programs at home for use in school.

(100% = All schools)

Type of school	1985	1986
Elementary schools	42.5%	55.2
Junior high schools	55.8	69.1
Senior high schools	81.9	84.1

The titles of some of the programs which teachers are recording and bringing to school are shown in Table 14. The most popular programs are NHK's "TV Sports Classroom" and the series, "NHK Special." The latter appears to be especially popular. It is being used by 27.6% of the senior high schools. This utilization rate is comparable to those given for educational television in Tables 7 and 8. Other series with high utilization rates include "Senior High School Lectures" and "Science and Humanity."

The results given in Table 14 were gathered by asking the respondents to check the programs they were using from a list included with the questionnaire. There was also space for writing in the names of other programs. Titles entered here included science programs such as "Watching" and "Close-up," as well as regional travelogues such as "Short Trips through the Kanto-Koshinetsu Region" and "Blue Lake Biwa." At the elementary school level, teachers were also using television school programs produced by prefectural boards of education and broadcast on local UHF channels.

Figure 15 shows how the utilization rates for general television programming have changed during the past seven years. As shown here, utilization rates at the junior and senior high school levels have been increasing slowly year by year. The senior high school utilization rate for academic year 1986, 75.1%, is higher than the utilization rates for NHK's television school programs.

The relationship between utilization of general television programs with that of television school programs is shown in Fig. 16. The utilization rate for television school broadcasting at

Table 14. Utilization of regular TV programming.

(100% = All schools)

		Elementary schools	Junior high schools	Senior high schools
	Used regular programs	19.1%	49.1	75.1
Program title	*Junior High School Dairy*	—	4.9%	—
	TV Sports Classroom	—	10.9	18.4
	Silk Road	—	3.6	18.7
	The Yellow River	—	2.2	8.6
	NHK Special	4.8	8.4	27.6
	Other NHK programs	5.7	4.7	14.7
	Commercial network programs	3.9	4.4	10.6

Note: Hyphens indicate items not included on questionnaire.

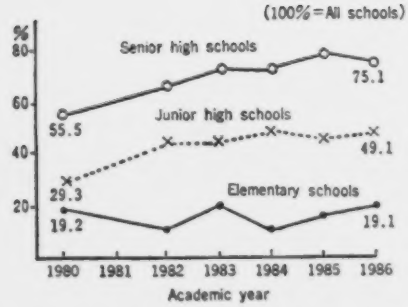

Fig. 15. General television program utilization rates.

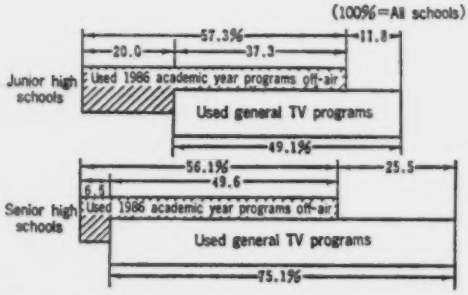

Fig. 16. Comparison of schools using television school programs versus general television programs during the 1986 academic year.

the junior high school level is 57.3% while that for general television programming is 49.1%. Many of the junior high schools are using both types of programs, but even so 11.8% of them use only general television programs. At the senior high school level, while 49.6% of the schools are using both television school broadcasting and general television programs, another 25.5% are using only the latter and just 6.5% are using only television school broadcasting. It should be noted, however, that these figures on use of television school broadcasting cover the use of programs broadcast during academic year 1986 only and do not include use of videotapes of television school programs broadcast in previous years.

A number of reasons as to why teachers are using general television programming are possible, for example:

For one, general television programs with high utilization rates, programs such as "Television Sports Classroom," oftentimes have no educational program counterpart or, if they do, it is not regularly available. Other frequently used programs, such as "NHK Special" or "The Silk Road," come under this category also. In other words, general television programming is not competing with educational broadcasts from a contextual aspect, instead, the teachers are seeking information and content which is normally not available through school programming alone.

The fact that general television programming is being used a great deal does, however, raise a number of unavoidable questions related to a variety of basic educational broadcasting concepts. First of all, the existence of programs which are being used rather extensively in the schools but which were prepared with little or no regard to the possibility that they might be used in education brings forth such questions as "exactly what is the educational value of school broadcasts." This important question is one which must continually be kept in mind by those planning and producing school broadcasts.

While, basically a part of the above question, using general television programming also directly contradicts the dictates of using school broadcasts as complete series and in their entirety. This is because general television programming has an extremely low degree of "seriality" and their use is very seldom on a planned, continuous basis. Also, many general television programs extend for 45 minutes or more, i.e., longer than the standard classroom period. It is therefore naturally impossible to use them in their entirety.

Table 15. TV school program utilization rates in schools using commercial videotapes.

	Junior high schools	Senior high schools
Program title	*World Geography*	*New North America*
Schools using commercial social studies videotapes (all schools)	58.0% (21.6)	20.8 (8.5)
Program title	*Science (Physics)*	*How Genes Work*
Schools using commercial science videotapes (all schools)	55.6% (37.6)	36.7 (20.4)

Table 16. Diffusion of microcomputers and other media.

(100% = All schools)

Type of school	Micro-computer	Color video cammera	Word processor	Videodisc player		
					VHD	Laser
Kindergartens	6.2%	31.2	21.4*	4.0*	3.2*	0.7
Nursery schools	4.7	16.8*	10.4*	3.3*	3.0*	0.3
Elementary schools	7.4*	77.8	28.5*	4.5*	2.2	1.1
Junior high schools	28.8*	81.5	46.5*	9.5*	3.8*	4.6*
Senior high schools	86.0*	88.6	88.4	11.3*	4.7*	6.2*

Note: * = Compared to 1985, meaningful at the 95% level of confidence.

They must, perforce, be used on a piecemeal basis—utilization which directly contradicts many traditional concepts of educational broadcasting utilization.

It goes without saying that the use of general television programming has given rise to a number of important topics and problems regarding future methods of utilizing school broadcasting.

XI. UTILIZATION OF LOCALLY-PRODUCED PROGRAMS

As shown in Table 16, video camera diffusion rates are also rather high. More and more teachers are beginning to use them to produce their own instructional programs. The survey for academic year 1986 showed that locally-produced programs were being used as follows:

Elementary Schools	75.0%
Junior High Schools	70.7%
Senior High Schools	79.5%

(100% = All schools)

These already relatively high figures appear to be increasing year by year.

The majority of locally-produced programs are of school excursions, graduation ceremonies or other school events. Locally-produced programs are also being used in instruction right alongside television school programs and commercially-produced videotapes.

The percentages of school making their own instructional videotapes is as follows:

Elementary Schools	40.8%
Junior High Schools	26.6%
Senior High Schools	25.3%

(100% = All schools)

Topics range acorss a broad spectrum, from demonstrating scientific experiments and gymnastic skills to sex education.

While the problem of quality has not been fully resolved, the fact that the teacher—here-to-for only a one-way consumer of broadcasting instructional materials—is now able to move over to the side of the producer may well revolutionize the teachers' ways of thinking about instructional television. For that reason, if for no other, it is important to pay greater attention to this steady increase in the numbers of teachers and schools involved in local production.

XII. UTILIZATION OF COMMERCIAL INSTRUCTIONAL MATERIALS

The introduction of videotape recorders into the schools has influenced not only the ways in which school broadcasting is now coming to be utilized, it has also greatly increased the variety of instructional materials available to the schools. Commercially-prepared instructional materials are one such example.

Commercial video instructional materials were being sold as early as the late 1960's, a time when only open-reel videotape recorders were available. Unfortunately they did not prove to be popular and distribution was extremely limited. By the early 1980's, however, cassette videotape technology had advanced to the point where not only were videotape recorders more flexible with numerous new features, size and price had also been greatly reduced. The videotape recorder diffusion rate at the senior high school level began to climb until now it is over 90%. Videotape recorders also began to be available in the average home and the video program industry began to grow. While most likely school instructional materials accounts for less than 1% of the total output of the video program industry, as shown in Fig. 17, the diffusion of commer-

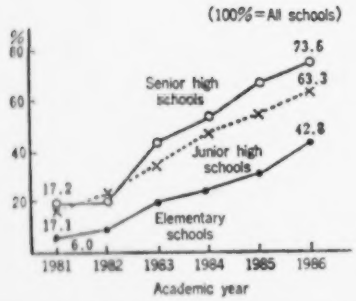

Fig. 17. Commercial video instructional material ownership by year.

cially-produced video into this closed market has also increased rapidly.

The results of the survey made just five years earlier, in 1981, showed that only about 17% of Japan's junior and senior high schools owned commercially-produced video materials. From 1982, however, the percentage of schools with commercially-produced tapes began to grow at a rate of around 10% a year. By academic year 1986, 63.3% of the junior high schools and 73.6% of the senior high schools owned commercial video materials. Diffusion into the elementary schools, however, is still at approximately one-half of these levels.

Figure 18 shows school ownership of commercially-produced videotapes by subject. While many of them are for subjects wherein NHK television school programming is not so strong, such as Physical Education and Health, it is also a fact that the schools have many commercially-produced videotapes in such fields as science and social studies—subjects in which utilization of NHK programs is rather high.

Looking at the content, structure and production techniques of these commercial instructional materials leave one with the impression that they are very different from school broadcasting programs. It is also often said that the producers of videotape instructional materials are directing their efforts towards areas wherein they will not have to complete with NHK's school programs. But, because NHK's programs as well as those produced commercially must be used within

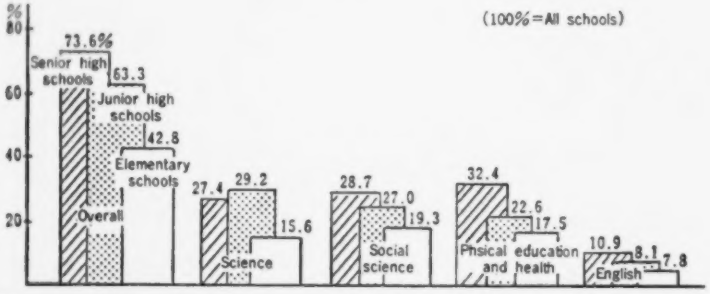

Fig. 18. Commercial video instructional material ownership by school subject matter.

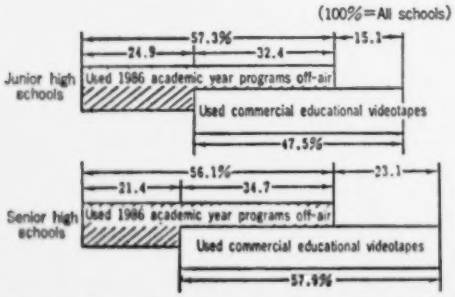

Fig. 19. Comparison of schools using television school programs and those using commercial video instructional materials during the 1986 academic year.

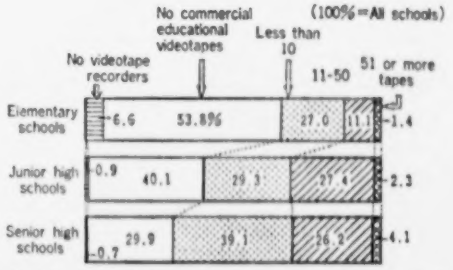

Fig. 20. Quantities of commercial videotapes instructional materials owned at each level of schooling.

the limited time frames available to the schools, it appears that at some point in the future competition may become unavoidable.

Just as Fig. 16 compared the use of school television programming with general television programming, Fig. 19 shows the relationship between the use of NHK school programs broadcast during academic year 1986 and that of commercial instructional video materials. As this figure shows, both types are being used by a majority of the schools.

At the junior high school level, 24.9% of the schools are using only NHK's television school programs and 15.1% are using only commercially-produced educational videotapes. Overall, the percentage using NHK's programs is higher. For senior high schools, while almost the same number using only NHK's programs are also using only commercial programs (21.4% and 23.1%, respectively), the total number of schools using commercial programs is slightly higher than is the number of those using NHK's programs.

The percentages given in Figs. 17, 18 and 19, however, are based upon any one school possessing and/or using even just one commercial instructional videotape. The use of one solitary commercial program should certainly not replace school broadcasting nor should a lessening in the use of school broadcasting as the number of commercially-produced videotapes owned by the schools increases be of any real concern.

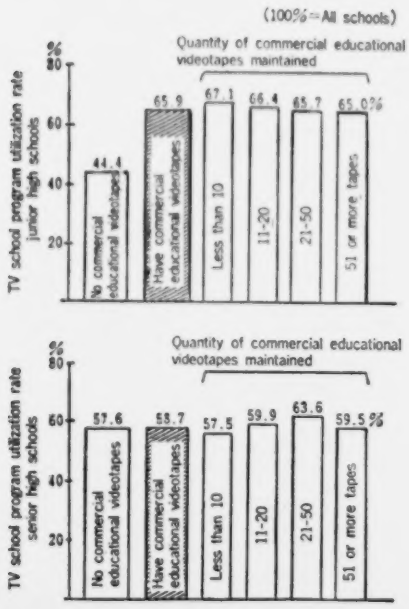

Fig. 21. Comparison of the number of commercial videotaped instructional materials owned by the schools and television school program utilization rates.

The number of commercially-produced videotapes owned at different levels of schools are shown in Fig. 20. Although the number of such tapes at the elementary school level is still rather low, already approximately 30% of the junior high schools now have 11 or more commercial instructional videotapes. Today, very few schools have more than 50 such programs but attention must be paid to these trends in the future.

One question is how does possession of commercial instructional programs effect with the use of television school broadcasts. Figure 21 gives this comparison. As can be seen here, schools which own commercially-produced video materials also tend to be high users of television school broadcasting. Also, television school program utilization rates continue to remain high even as the number of commercial programs owned by the school increases. This relationship appears to be very similar to that for the use of school instructional programs from previous years compared to that for those being broadcast during the current year.

An investigation into the relationship between television school programs and commercial videotapes by school subject shows the same general trends. As given in Table 15, schools which use commercial social studies programs are also greater users of the television social studies program, "World Geography." While this table gives the figures for only two programs, one in social studies and the other in science, the same relationships appear to hold true for other school broadcasting programs as well.

A review of the replies received in this survey seems to indicate that commercially-prepared video materials and television school broadcasting programs are presently in a state of coexistence rather than being in competition with each other.

The present situation is such that the schools not only have current off-air school instructional programs at their command, but also have access to videotapes of programs broadcast during previous years, videotapes taken from general television programming and even commercially-produced videotapes. Given this situation, the percentages of schools at each level still using only currently broadcast school programs off-air is as follows:

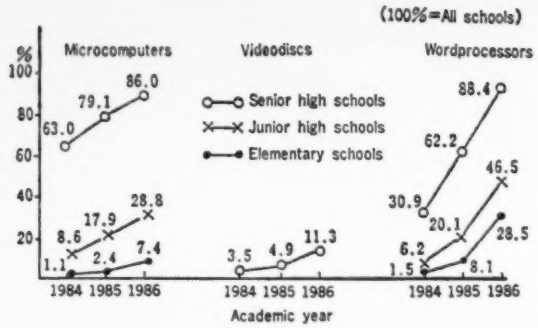

Fig. 22. Trends in microcomputer, videodisc and word processor ownership.

Elementary Schools	55.2%
Junior High Schools	6.0%
Senior High Schools	2.2%
	(100% = All schools)

XIII. THE DIFFUSION OF OTHER NEW EDUCATIONAL MEDIA

Today's wide variety of educational media first began to appear in the classroom in Japan from about 1975. This influx began to turn into a torrent in 1985. Figure 22 shows how school microcomputer, videodisc and word processor ownership has grown during the past three years. Between 1984 and 1986 the diffusion rate for microcomputers in senior high schools grew from 63.05 to 86.0%, a leap of over 20%. Although somewhat slower, microcomputer diffusions rates in elementary and junior high schools have also increased considerably. The diffusion rates for videodiscs at the senior high school level have also grown, going from a mere 3.5% in 1984 to 11.3% in 1986, a three-fold increase in just three years.

As educational media, videodiscs are functionally related to television; both being capable of presenting moving images of physical objects. Looking at television from the standpoint of its capability to display moving images, however, also shows that, as exemplified in the idea of "Programs should be used in their entirety," television school programs are prepared in segments lasting from 15 to 20 minutes and with the emphasis upon their direct instructional capabilities, capabilities which are comparable to those of the human teacher.

Many videodiscs, on the other hand, are produced by gathering a number of discrete instructional segments together onto a single disc. They are also clearly characterized by the fact that they are primarily meant to supplement the textbook instructional materials. In other words, the educational philosophy behind videodiscs is basically very different from that of television.

During the forthcoming diffusion process will videodiscs and television, as a result of this basic philosophical difference, become bitter competitors over which one's characteristics are most appropriate to instruction? Or, while respectively securing their individual own places in education will these two media, each with its own separate and distinct educational philosophy, come to be used simultaneously but separately? It will be interesting to see how each of these media continue to evolve.

Microcomputers are basically instructional media or tools designed for individual learning. As instructional tools they are very different from television and it is doubtful that they will ever come into direct competition with instructional television materials. However, considering how rapidly they are being accepted into the schools, it is possible that microcomputers will eventually have considerable impact upon television school broadcasting from the standpoints of governmental guidance, the limitations of educational budgets and the fact that the teachers' interests may already be turning towards these new "toys."

Figure 23 compares NHK junior and high school television school program utilization rates with whether or not the schools own any microcomputers (and, if so, how many). A look at the right half of the figure on senior high schools shows that today 86.0% of the nation's senior high schools own at least one microcomputer while only 14.0% of them don't have one. Of those senior high schools owning microcomputers, 15.1% have only one, 28.3% have from

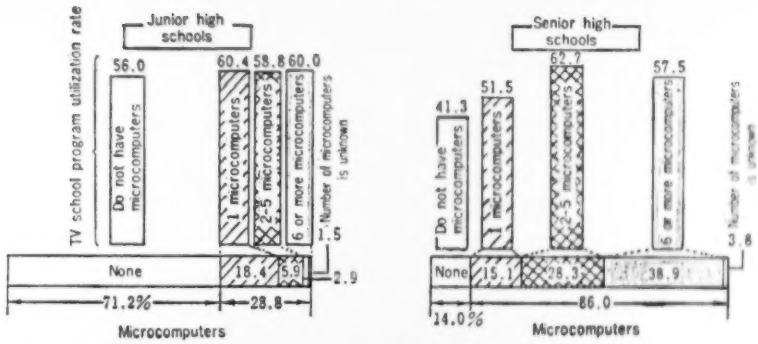

Fig. 23. Comparison of microcomputer ownership with NHK television school program utilization.

Table 17. Microcomputer utilization.

(100% = All schools)

Type of school	Utilization					
	CAI	CMI	Material display	Word processor	Available to students	Other
Kinder-gartens	0.5% (1.4)	3.7 (2.9)	0.8 (0.7)	3.7 (4.0)	N/A	0.5 (0.4)
Nursery schools	0.3 (0.1)	2.6 (1.7)	0.1 (0.0)	3.0 (2.0)	N/A	0.5 (0.3)
Elementary schools	1.2 (0.9)	2.0 (0.6)	0.8 (0.4)	5.0 (1.2)	1.0 (—)	1.9 (0.5)
Junior high schools	2.4 (2.1)	17.5 (10.8)	2.4 (1.1)	17.7 (8.9)	3.6 (—)	7.3 (4.9)
Senior high schools	21.2 (19.3)	55.9 (52.6)	15.2 (11.8)	54.8 (44.1)	19.2 (—)	25.5 (25.0)

Note: ( ) = Figures for academic year 1985.
"Available to students" was not included in the 1985 questionnaire.

two to five, and 38.9% have six or more. In other words, today, nearly one-third of the senior high schools in Japan own six or more microcomputers.

As shown in Fig. 23, from 50 to 60 percent of those senior high schools owning at least one microcomputer are also using NHK television school broadcasting. It is not really possible to say that those schools with more microcomputers have lower television school broadcasting utilization rates. As shown on the right of Fig. 23, these same conclusions appear to also hold true at the junior high school level. This data is probably accurate not only because microcomputers are primarily tools for individual learning but also, if for no other reason, also because it is not really possible for a school having only five or six microcomputers to conduct computer assisted instruction (CAI) on anything like a school-wide basis.

As long as there is an average of only five or six microcomputers available in each school, it is doubtful that they will have any real degree of influence upon the utilization of television school broadcasts. However, if and when the average number of microcomputers per school begins to get into the twenties, the thirties or beyond, it is possible that the relationship between microcomputer ownership and television school program utilization rates will become much more apparent.

The 1986 survey on school broadcasting included questions on how the schools were using microcomputers. The results are listed in Table 17. As this shows, microcomputers are used primarily for computer managed instruction (CMI) or word processing, both being somewhat over one-half at the senior high school level. In other words, microcomputers are being used to record and analyze student grades, and to prepare tests and other documents. Just 21.2% of the senior high schools and only a little over 1% of the elementary schools were conducting computer assisted instruction, i.e., were involved in any direct

student use of microcomputers as instructional materials. Both of these figures changed but slightly from the previous year. With the often-repeated problems of insufficient software and/or not enough quality software, the number of schools where each student is able to sit down with a computer as part of his learning is still relatively small. This fact is also reflected in the results shown in Fig. 23.

Although not shown elsewhere, a look at the relationship between videodisc ownership and television school broadcasting utilization rates indicates that 59.8% of those senior high schools owning videodiscs were using television school programs while those without videodisc equipment had a rate of 55.6%. This difference is not significant. In other words, there is no indication that schools owning videodisc equipment use school broadcasting to any lesser extent than do those which do not.

However the number of videodiscs per school is still extremely low. Even for senior high schools —which have the highest degree of ownership— the average school owns only 15.9 discs. At the junior high school level this drops to 7.9 discs and in the elementary schools goes down even further, to just 3.8 discs per school. It can be said that this new instructional media is still not being fully utilized in Japan. Therefore, it is possible that as the quantity of videodisc equipment and the number of videodiscs available in the schools begins to increase, this medium will come to effect television school broadcasting utilization.

While, a great many people have begun to call for an educational revolution based upon the development of these new educational media, as far as can be seen from the results of the 1986 academic year survey these media have yet to become all that popular in the schools. However, following their development must be an important part of all future surveys.

XIV. CONCLUSION

This short, detailed report has emphasized how the diffusion of video recorders has changed the ways in which educational broadcasting is being utilized in Japan. Taken from the perspective of the historical processes behind the development of educational broadcasting, it appears that educational broadcasting is now going through a major revolution. The results of this survey should play an important role in helping bring about the coming reformation of the Japanese school system. The design of and the ways in which these surveys are analyzed will also most likely be very important to helping educators and others understand or predict the actual methods by which these so-called new media will come to be used in education. This survey and report should also be useful in clarifying how educational broadcasting may change over the next several years as a result of the development and diffusion of videotape technology.

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